REMARKS

In the Claims:

Claims 27-34 remain in this application. Claims 35-38 have been canceled.

Claims 35-38:

Claims 35 through 37 were rejected for various reasons. Claims 35-38 have been canceled, rendering the rejections moot. Entrance of this amendment is requested, as it raises no new issues of patentability. Applicants note that while the Examiner failed to assert a rejection of claim 38 in the Final Action, this claim has been canceled to simplify the issues in preparation for a possible appeal.

Rejections Under 35 U.S.C. 103(a):

Claims 27-31 were rejected under 35 U.S.C. 103(a) as being unpatentable over Visokay et al. (U.S. Pub. 2003/0045080) (hereinafter "Visokay") in view of Boyd et al. (U.S. 6,845,778) (hereinafter "Boyd"). Claims 32-34 were rejected under 35 U.S.C. 103(a) as being unpatentable over Visokay in view of Boyd and Ahn et al. (U.S. Pub. 2004/0043569) (hereinafter "Ahn"). Similar rejections were presented in a previous Office Action dated July 1, 2005.

Applicants reassert their prior argument: the cited prior art fail to provide a suggestion or motivation to combine them to result in the method recited in claim 27. Because there is no indication found within the references that the sonic energy disclosed in Boyd to remove particles from the surface of a substrate would also be useful to remove impurities from a high-k dielectric layer, one of skill in the art would not be motivated to combine Boyd with Visokay as suggested by the Examiner. Boyd discloses a megasonic method to clean the

surface of a substrate (*see*, Boyd, col. 1, lines 6-9). Megasonic cleaning causes cavitation, in which microscopic bubbles are formed and collapse. Their collapse releases energy which, "assists in particle removal through breaking the various adhesion forces which adhere the particle to the substrate." (Boyd, col. 1, lines 25-27.) Megasonic cleaning also uses acoustic streaming to cause pressure waves that control particle re-adhesion. (Boyd, col. 1, lines 36-38.) Boyd improves on standard megasonic cleaning by providing localized heating of a region of liquid. (Boyd, col. 2, lines 33-36.) However, nothing in Boyd indicates that the megasonic cleaning method, useful to remove particles from the surface of a substrate, would also be of use in removing impurities from a high-k layer. The rejections are unsupported in the art and should be removed.

The Examiner's response to Applicants' previous arguments, that, "the motivation to use the sonic energy taught by Boyd in the cleaning process disclosed by Visokay is that the sonic energy provides greater cleaning power and cleaning efficiency" (Final Action, page 9), ignores the difference between cleaning a particle from a surface of a substrate and removing impurities from a substrate. Whether or not sonic energy provides greater cleaning power may be relevant to removing particles, but it would not motivate one of skill in the art to use sonic energy to remove impurities. As stated above, there is no indication in the cited references that the megasonic cleaning method of Boyd, useful to remove particles from the surface of a substrate, would also be of use in removing impurities from a high-k layer. The rejections should be withdrawn.

Claims 28-34 depend from claim 27. The rejections of these claims should be withdrawn for the same reasons as provided above with respect to claim 27. Regarding claims 32-34, the Ahn reference fails to rectify the deficiency in the rejection identified above.

In addition, claim 33 further recites that the impurities permeate through the high-k gate dielectric layer and thereby further highlights the difference between Boyd and the recited method. There is absolutely no scintilla of evidence in the cited references that sonic energy, used to clean a surface of a substrate, would be useful to remove impurities that permeate through a layer. The rejection is unsupported in the art and should be withdrawn.

Respectfully submitted,

Date: February 15, 2006

Michael D. Plimier
Reg. No. 43,004
ATTORNEY FOR APPLICANTS

Intel Corporation
Mail Stop SC4-202
P.O. Box 5326
Santa Clara, CA 95056-5326
(408) 765-7857